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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/579,638 | WELBERS ET AL. | |
| | Examiner | Art Unit | |
| | YONG SIM | 2629 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *16 September 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments filed 9/16/2010 have been fully considered but they are not persuasive.

With respect to the Applicant's argument regarding claims 1 – 7 and 9, the Applicant argues that Lambert fails to teach that the additional output channel replaces one of the corresponding output channels having a corresponding column electrode only during a brief time period that the corresponding output channel is calibrated.

However, Examiner respectfully disagrees. Lambert teaches on pages 9 - 10, that the additional output channel, which is the output of the spare column driver circuit, connected to the corresponding column electrode during the test of the corresponding column, which would be a brief time period.

The Applicant further argues that Lambert teaches that once the spare driver is used in place of the "defective" drive, the defective drive is not used any more. Examiner respectfully acknowledges that the defective drive is not used anymore once the spare driver is used. However, as recited in claim 1, there are "n" column electrodes, and even if one of the spare driver is not used anymore, there are still "n" number of additional output channels to calibrate “n” number of column electrodes.

Therefore, the argument is moot and the previous rejection is maintained.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 10 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 10 recites in lines 7 – 8, “said third plurality of output channels having no corresponding output channel;”. It is indefinite to say that an output channel has not corresponding output channel.

For the purpose of art rejection, the limitation will be construed as, “said third plurality of output channels having no corresponding column electrode."

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 1 – 7 and 9 – 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Lambert (WO 01/39163 A2).**

Regarding claim 1, Lambert teaches circuit arrangement for driving a display arrangement the circuit arrangement includes column driving means (11 "a block of column drivers" Fig. 2) for driving n column electrodes and row driving means for driving m row electrodes of the display arrangement (abstract: “A matrix display panel having a plurality of columns/electrodes, comprising a plurality of circuits each being adapted for selectively accessing one of said columns.” A matrix display inherently comprises m row electrodes and row driving means.), wherein the column driving means (11 “a block of column drivers” Fig. 2) comprises n output channels (12 “column driver circuit/channel" Fig. 2) each output channel having a column electrode assigned (See fig. 2 for the assignment arrangement.) and is arranged for providing a respective column voltage to the assigned column electrode (See Fig. 2, each column driver circuit 12 provides output/column voltage to the assigned column electrodes 33.), an additional output channel (10 "spare column driver” Fig. 2) is arranged for providing respective column voltages, whereas each of the n column electrodes is connectable to the additional output channel (Pg. 10, lines 3 – 5; “The output of the spare column driver circuit is used to drive the column 22 corresponding to the column driver circuit 23 under test.” See Fig. 2. Each of the columns is connectable to the spare column driver circuit. Pg. 10, line 12; “the output of the column driver is an analog medium voltage.”), the additional output channel thereby replacing a respective one of the n output channels which the column electrode is assigned to (See Fig. 2 and Pg. 10, lines 1 – 5, “The

output of the spare column driver circuit is used to drive the column corresponding to the column driver circuit under test."),

characterized in that the circuit arrangement is controlled in use such that at the beginning of driving a first row electrode of a frame the additional output channel is calibrated (Pg. 3, lines 5 – 7; "the output of the normal column drivers are systematically compared with the output of a spare column driver, to detect flawed normal column drivers, for example during a power on self test or continuously during operation." The continuous comparison/test includes the beginning of driving a first row electrode of a frame. Pg. 10, lines 3 – 5; "The output of the spare column driver circuit is used to drive the column corresponding to the column drive circuit under test." The spare column driver circuit is calibrated to output the corresponding output signal of the column drive circuit under test.), wherein during driving the following row electrodes the additional output channel is successively connected via the respective switching means to the column electrodes (Pg. 10, lines 25 – 26; "This process continues serially/successively until all column driver circuits are tested, and may repeat continuously..." The output channel is successively connected via respective multiplexer/switching mean to the column electrodes during driving of each row electrodes.), wherein the associated output channel of the column electrode currently connected to the additional output channel is disconnected from the respective column electrode for calibrating (Pg. 10, lines 1 – 3; "During the test of a column, the multiplexers are controlled so that the output of the column drive circuit under test is multiplexed onto test line." See Fig. 2.

The tested column driver 23 is disconnected from the column electrode 28 and is instead connected to the comparator 25.).

Regarding claim 2, Lambert teaches circuit arrangement as claimed in claim 1, wherein the n output channels having switching means (19, 20 "multiplexers/switching means" Fig. 2) each of the n switching means is provided between an output channel and its associated column electrode for connecting the column electrode with the additional output channel (See fig. 2 for the connection arrangement of the switching means.).

Regarding claim 3, Lambert teaches circuit arrangement as claimed in claim 2, wherein the switching means are provided for disconnecting the output channel from its column electrode if the column electrode is connected to the additional output channel (Pg. 10, lines 1 – 5; “During the test of a column, the multiplexers/switching means are controlled so that the output of the column drive circuit under test is multiplexed onto test line… The output of the spare column driver circuit is used to drive the column corresponding to the column drive circuit under test.”).

Regarding claim 4, Lambert teaches circuit arrangement as claimed in claim 1, wherein at the beginning of driving a first row electrode of a frame the additional output channel is calibrated (Pg. 3, lines 5 – 7; “the output of the normal column drivers are systematically compared with the output of a spare column driver, to detect flawed

normal column drivers, for example during a power on self test or continuously during operation." The continuous comparison/test includes the beginning of driving a first row electrode of a frame. Pg. 10, lines 3 – 5; "The output of the spare column driver circuit is used to drive the column corresponding to the column drive circuit under test." The spare column driver circuit is calibrated to output the corresponding output signal of the column drive circuit under test.), whereas during driving the following row electrodes the additional output channel is successively connected via the respective switching means to the column electrodes (Pg. 10, lines 25 – 26; "This process continues serially/successively until all column driver circuits are tested, and may repeat continuously..." The output channel is successively connected via respective multiplexer/switching mean to the column electrodes during driving of each row electrodes.), whereas the associated output channel of the column electrode currently connected to the additional output channel is disconnected from the respective column electrode for calibrating (Pg. 10, lines 1 – 3; "During the test of a column, the multiplexers are controlled so that the output of the column drive circuit under test is multiplexed onto test line." See Fig. 2. The tested column driver 23 is disconnected from the column electrode 28 and is instead connected to the comparator 25.).

Regarding claim 5, Lambert teaches circuit arrangement as claimed in claim 1, wherein the column driving means comprises more than one additional output channel which are connectable to the column electrodes (Pg. 3, lines 21 – 23; in essence, the

first and second techniques may be expanded to an increased number of spare column drivers per block.").

Regarding claim 6, Lambert teaches circuit arrangement as claimed in claim 1, wherein calibration means are arranged for offset cancellation of the output channels connected to the calibration means (Pg. 10, lines 20 – 23; "If the comparator/calibration means determines that the column driver circuit under test is defective, the scan operation ceases, and the column driver circuit under test is persistently functionally replaced with the spare column driver circuit." If the output voltage of the driver circuit compared with the output of the spare column driver is offset, meaning different, the driver circuit ceases scanning/cancellation. Thus, the comparator/calibration means performs offset cancellation of the output channels.).

Regarding claim 7, Lambert teaches display device comprising a display arrangement and a display driver circuit arrangement the display driver circuit arrangement comprises column driving means (11 "a block of column drivers" Fig. 2) for driving the n column electrodes with column voltages and row driving means for driving the m row electrodes with row selection voltages (abstract: "A matrix display panel having a plurality of columns/electrodes, comprising a plurality of circuits each being adapted for selectively accessing one of said columns." A matrix display inherently comprises m row electrodes and row driving means.), wherein the column driving means (11 "a block of column drivers" Fig. 2) comprises n output channels (12

“column driver circuit/channel" Fig. 2) each output channel having a column electrode assigned (See fig. 2 for the assignment arrangement.) and is arranged for providing a respective column voltage to the assigned column electrode (Pg. 10, line 12; “the output of the column driver is an analog medium voltage.” See Fig. 2, each column driver circuit 12 provides output/column voltage to the assigned column electrodes 33.), an additional output channel (10 "spare column driver” Fig. 2) is arranged for providing a column voltage, whereas each of the n column electrodes is connectable to the additional output channel (Pg. 10, lines 3 – 5; “The output/column voltage of the spare column driver circuit is used to drive the column 22 corresponding to the column driver circuit 23 under test.” See Fig. 2. Each of the columns is connectable to the spare column driver circuit.); and

means for driving a first row electrode while the additional output channel is calibrated and for driving a plurality of row electrodes (Pg. 3, lines 5 – 7; “the output of the normal column drivers are systematically compared with the output of a spare column driver, to detect flawed normal column drivers, for example during a power on self test or continuously during operation." The continuous comparison/test includes the beginning of driving a first row electrode of a frame. Pg. 10, lines 3 – 5; “The output of the spare column driver circuit is used to drive the column corresponding to the column drive circuit under test.” The spare column driver circuit is calibrated to output the corresponding output signal of the column drive circuit under test.), one at a time in sequence, while connecting the additional output to a plurality of column electrodes, one at a time in sequence (Pg. 10, lines 25 – 26; “This process continues

serially/successively until all column driver circuits are tested, and may repeat continuously..." The output channel is successively connected via respective multiplexer/switching mean to the column electrodes during driving of each row electrodes.), and for calibrating the output channel corresponding to the connected column electrode (Pg. 10, lines 1 – 3; "During the test of a column, the multiplexers are controlled so that the output of the column drive circuit under test is multiplexed onto test line." See Fig. 2. The tested column driver 23 is disconnected from the column electrode 28 and is instead connected to the comparator 25.).

Regarding claim 9, Lambert teaches method for driving a display arrangement whereas the display arrangement comprises n column electrodes and m row electrodes, the n column electrodes are driven by column driving means and the row electrodes are driven by row driving means (abstract: "A matrix display panel having a plurality of columns/electrodes, comprising a plurality of circuits each being adapted for selectively accessing one of said columns." A matrix display inherently comprises m row electrodes and row driving means.) wherein the column driving means(11 "a block of column drivers" Fig. 2) comprises n output channels (12 "column driver circuit/channel" Fig. 2) each providing a respective column voltage to its associated column electrode (Pg. 10, line 12; "the output of the column driver is an analog medium voltage." See Fig. 2, each column driver circuit 12 provides output/column voltage to the assigned column electrodes 33.) wherein an additional output channel is arranged (Pg. 10, lines 3 – 5; "The output of the spare column driver circuit is used to drive the column 22

corresponding to the column driver circuit 23 under test." See Fig. 2. Each of the columns is connectable to the spare column driver circuit.), which is calibrated at the beginning of a driving procedure of a frame (Pg. 3, lines 5 – 7; "the output of the normal column drivers are systematically compared with the output of a spare column driver, to detect flawed normal column drivers, for example during a power on self test or continuously during operation." The continuous comparison/test includes the beginning of driving a first row electrode of a frame. Pg. 10, lines 3 – 5; "The output of the spare column driver circuit is used to drive the column corresponding to the column drive circuit under test." The spare column driver circuit is calibrated to output the corresponding output signal of the column drive circuit under test.), wherein after the additional output channel is calibrated, one of the n output channels is disconnected from its associated column electrode (Pg. 10, lines 1 – 3; "During the test of a column, the multiplexers are controlled so that the output of the column drive circuit under test is multiplexed onto test line." See Fig. 2. The column drive circuit under test 23 is disconnected from the column electrode 28 and is instead connected to the comparator 25.), wherein this column electrode is connected to the calibrated additional output channel (See Fig. 2. The spare column driver circuit is connected to the column electrode 28 of the column drive circuit under test 23.), the calibrated additional output channel supplies the respective column voltage to the column electrode (Pg. 10, lines 3 – 5; "The output of the spare column driver circuit is used to drive the column corresponding to the column drive circuit under test." The spare column driver circuit is calibrated to output the corresponding output signal of the column drive circuit under

test.)whereas the disconnected output channel is calibrated (Pg. 10, lines 1 – 3; “During the test of a column, the multiplexers are controlled so that the output of the column drive circuit under test is multiplexed onto test line.”).

Regarding claim 10, Lamber teaches a method of operating a display device having a first plurality of column electrodes (See Fig. 2, each column driver circuit 12 provides output/column voltage to the assigned column electrodes 33.) and a second plurality of row electrodes, arranged in a matrix (abstract: “A matrix display panel having a plurality of columns/electrodes, comprising a plurality of circuits each being adapted for selectively accessing one of said columns.” A matrix display inherently comprises m row electrodes and row driving means.), and a third plurality of output channels (12 “column driver circuit/channel" Fig. 2), with at least one column electrode having a corresponding output channel, but with at least one output channel having no corresponding column electrode (See Fig. 2 for the output channel arrangement.), and a fourth plurality of switches each of said switches for connecting one of said third plurality of output channels to one of said first plurality of column electrodes (See Fig. 2 for the switch arrangement.), wherein said method comprising:

a) calibrating one of said third plurality of output channels having no corresponding output channel (Pg. 10, lines 3 – 5; “The output of the spare column driver circuit is used to drive the column corresponding to the column drive circuit under test.” Pg. 10, lines 0 – 11; "The spare column loads the data value of the column driver

under test 23 in parallel." The spare column driver circuit is calibrated to output the corresponding output signal of the column drive circuit under test.);

b) connecting said calibrated output channel to a first column electrode through one of said fourth plurality of switches (Pg. 10, lines 25 – 26; “This process continues serially/successively until all column driver circuits are tested, and may repeat continuously...” The output channel is successively connected via respective multiplexer/switching mean to the column electrodes during driving of each row electrodes.); and

c) simultaneous with the connecting step, calibrating a first output channel corresponding to the first column electrode (Pg. 3, lines 5 – 7; “the output of the normal column drivers are systematically compared with the output of a spare column driver, to detect flawed normal column drivers, for example during a power on self test or continuously during operation.").

Regarding claim 11, Lambert teaches the method of claim 10 further comprising:

d) disconnecting said calibrated output channel from the first column electrode;

e) connecting said first output channel to the first column electrode through one of said fourth plurality of switches;

f) connecting said calibrated output channel to a second column electrode through one of said fourth plurality of switches; and

g) simultaneous with the connecting step, calibrating a second first output channel corresponding to the second column electrode (Pg. 10, lines 22 – 27; “If the comparator determines that the column driver circuit under test is not defective, the scan operation continues, and the adjacent column driver circuit is tested against the spare column driver circuit. This process continues serially until all column driver circuits are tested, and may repeat continuously unless and until a defective column driver circuit is identified.").

Regarding claim 12, Lamber teaches the method of claim 11, further comprising:

continuing the steps of (d) – (g) for each calibrated output channel and for connecting and calibrating another output channel for each of third plurality of output channels (Pg. 10, lines 22 – 27; “This process continues serially until all column driver circuits are tested, and may repeat continuously unless and until a defective column driver circuit is identified.").

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. **Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lambert in view of Webb (US 6,600,467 B1).**

Regarding claim 8, Lambert teaches display device as claimed in claim 7.

But Lambert does not expressly disclose wherein the display arrangement comprises a liquid crystal material between a first substrate provided with row electrodes and a second substrate provided with column electrodes in which overlapping parts of the row and column electrodes define pixels.

However, in the same field of endeavor, Webb teaches an LCD display wherein the display comprises a liquid crystal material between a first substrate provided with row electrodes and a second substrate provided with column electrodes in which overlapping parts of the row and column electrodes define pixels (Webb: See Fig. 2B. Col. lines 36 – 48.).

Therefore, taking the combined teachings of Lambert and Webb, as a whole, it would have been obvious to a person having ordinary skill in the art to incorporate the idea of having an LCD display comprising a liquid crystal material between a first

substrate provided with row electrodes and a second substrate provided with column electrodes in which overlapping parts of the row and column electrodes define pixels as taught by Webb into the display device as taught by Lambert to obtain a display device comprising a liquid crystal material between a first substrate provided with row electrodes and a second substrate provided with column electrodes in which overlapping parts of the row and column electrodes define pixels to allow manufacturing a high resolution display.

### *Conclusion*

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YONG SIM whose telephone number is (571)270-1189.

The examiner can normally be reached on Monday - Friday (Alternate Fridays off) 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/YONG SIM/
Examiner, Art Unit 2629

/Amr Awad/
Supervisory Patent Examiner, Art Unit 2629

11/9/2010